

## EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	5	watermark\$5 and "wobble".ab.	US-PGPUB; USPAT	OR	OFF	2006/05/13 15:44
S2	10	watermark\$5 and "wobble".ab.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/24 20:02
S3	96	watermark\$5 and "wobble"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/24 20:03
S4	14	watermark\$5 and "wobble" and playback.ab.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/24 20:10
S5	47	watermark\$5 and "wobble" and (copy with control)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/03/24 20:10
S6	47	watermark\$5 and "wobble" and (copy with control)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/03/24 20:16
S7	1	watermark\$5 and "wobble" and (copy with control) and @py<"2001"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/03/24 20:11
S8	13	S6 and record\$5.ti.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/03/28 15:28

## EAST Search History

S9	989	713/193.ccls.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/04/03 15:59
S10	2932	713/200.ccls.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/04/03 15:59
S11	1	"6707774".pn.	USPAT	OR	OFF	2005/09/27 16:33
S12	1	"5901127".pn.	USPAT	OR	OFF	2005/09/27 16:34
S13	1	(prevent\$4 prohibit\$5) with (embed\$5 insert\$4) with (watermark\$2) with (playback)	USPAT	OR	OFF	2005/09/27 16:36
S14	0	(prevent\$4 prohibit\$5) near2 (embed\$5 insert\$4) with (watermark\$2) with (playback)	USPAT	OR	OFF	2005/09/27 16:36
S15	17	(prevent\$4 prohibit\$5) near2 (embed\$5 insert\$4) with (watermark\$2)	USPAT	OR	OFF	2005/09/27 16:42
S16	0	(remov\$4 delet\$4 eras\$3) near3 (watermark\$2) with (playback adj data)	USPAT	OR	OFF	2005/09/27 16:43
S17	2	(remov\$4 delet\$4 eras\$3) near3 (watermark\$2) with (playback)	USPAT	OR	OFF	2005/09/27 16:44
S18	6	(remov\$4 delet\$4 eras\$3) near3 (watermark\$2) with (playback)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/09/27 16:49
S19	8	(prevent\$4) near2 (embed\$5 insert\$5) near3 (watermark\$2) and playback	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/09/27 16:50
S20	59	(prevent\$4) near2 (embed\$5 insert\$5) near3 (watermark\$2)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/09/27 17:04

## EAST Search History

S21	958	380/201-204.ccls.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/04/23 16:28
S22	253	380/201-204.ccls. and watermark\$	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/09/27 17:05
S23	186	380/201-204.ccls. and watermark\$ with (embed\$4 insert\$4)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/09/27 17:05
S24	1	"6092201".pn.	USPAT	OR	OFF	2006/05/06 18:37
S25	56	selectiv\$4 with (add\$4 embed\$4) with watermark\$2	US-PGPUB; USPAT	OR	OFF	2006/05/13 15:49
S26	5	selectiv\$4 with (add\$4 embed\$4) with watermark\$2 same (record\$4)	US-PGPUB; USPAT	OR	OFF	2006/05/13 15:45
S27	685	determin\$2 with (add\$4 embed\$4) with watermark\$2	US-PGPUB; USPAT	OR	OFF	2006/05/13 15:49
S28	1034	382/233.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/04/21 13:08
S29	25	382/233.ccls. and (playback same record\$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/04/23 14:39
S30	13	382/233.ccls. and (embed\$5 insert\$5) near3 (watermark\$2)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/04/21 13:02

## EAST Search History

S31	1146	382/100.ccls. and (embed\$5 insert\$5) near3 (watermark\$2)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/04/21 13:06
S32	2417	382/100.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/04/21 13:02
S33	135	382/100.ccls. and (playback same record\$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/04/21 13:04
S34	1769	713/193.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/04/21 13:04
S35	539	382/100.ccls. and (embed\$5 insert\$5) near3 (watermark\$2) and (RAM ROM)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/04/21 13:06
S36	0	382/233.ccls. and (degrad\$7) with (playback) with (watermark)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/04/21 13:08
S37	0	382/233.ccls. and (degrading degradation weak\$5) with (playback) with (watermark)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/04/21 13:08

## EAST Search History

S38	4	382/100.ccls. and (degrading degradation weak\$5) with (playback) with (watermark)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/04/21 13:09
S39	2	713/176.ccls. and (degrading degradation weak\$5) with (playback) with (watermark)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/04/21 13:10
S41	65	watermark\$5 and "wobble" and (copy with control)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/04/21 13:11
S42	1325	380/201-204.ccls.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/04/21 13:12
S43	236	380/201-204.ccls. and (embed\$5 insert\$5) near3 (watermark\$2)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/04/21 13:16
S44	77	(recording) same (playback) same (embedd\$4 near3 watermark\$2)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/04/21 13:49
S45	1122	SAKO.in. with YOICHIRO	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/04/21 13:49
S46	0	SAKO.in. with YOICHIRO and (watermark).in.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/04/21 13:50

## EAST Search History

S47	8	SAKO.in. with YOICHIRO and (watermark).clm.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/04/23 14:08
S48	179	INOKUCHI.in. with TATSUYA	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/04/23 14:08
S49	4	INOKUCHI.in. with TATSUYA and watermark.clm.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/04/23 14:09
S50	228	FURUKAWA.in. with SHUNSUKE	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/04/23 14:09
S51	4	FURUKAWA.in. with SHUNSUKE and watermark.clm.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/04/23 14:10
S52	62	sony.as. and watermark.clm.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/04/23 14:27
S53	2360	713/176.ccls.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/04/23 14:27
S54	1377	713/176.ccls. and (embed\$6 insert\$4 with watermark\$4)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/04/23 14:27

## EAST Search History

S55	939	380/201.ccls.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/04/23 14:38
S57	10	382/276.ccls. and (playback same record\$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/04/23 14:39
S58	19	382/276.ccls. and watermark	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/04/23 16:07
S59	40	713/193.ccls. and (watermark).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/04/23 16:07
S60	20	713/193.ccls. and (watermark).clm. and (record\$).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/04/23 16:12
S61	168	713/176.ccls. and (watermark).clm. and (record\$).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/04/23 16:12
S62	17	713/176.ccls. and (watermark).clm. and (record\$).clm. and (playback).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/04/23 16:13

## EAST Search History

S63	17	382/100.ccls. and (watermark).clm. and (record\$).clm. and (playback).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/04/23 16:14
S64	0	382/233.ccls. and (watermark).clm. and (record\$).clm. and (playback).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/04/23 16:15
S65	8	380/201.ccls. and (watermark).clm. and (record\$).clm. and (playback).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/04/23 16:19
S67	0	382/276.ccls. and (watermark).clm. and (record\$).clm. and (playback).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/04/23 16:17
S68	1	380/202.ccls. and (watermark).clm. and (record\$).clm. and (playback).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/04/23 16:19
S69	5	380/203.ccls. and (watermark).clm. and (record\$).clm. and (playback).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/04/23 16:22
S70	0	380/204.ccls. and (watermark).clm. and (record\$).clm. and (playback).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/04/23 16:28

## EAST Search History

S72	939	380/201.ccls.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/04/23 16:29
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### 1 Technical trials and legal tribulations

Scott Craver, Boon-Lock Yeo, Minerva Yeung  
July 1998 **Communications of the ACM**, Volume 41 Issue 7

**Publisher:** ACM Press

Full text available: [pdf\(641.01 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#), [review](#)



### 2 Watermarking cyberspace

Hal Berghel  
November 1997 **Communications of the ACM**, Volume 40 Issue 11

**Publisher:** ACM Press

Full text available: [pdf\(1.70 MB\)](#) Additional Information: [full citation](#), [citations](#), [index terms](#)

### 3 Digital watermarking makes its mark

Hal Berghel  
September 1998 **netWorker**, Volume 2 Issue 4

**Publisher:** ACM Press

Full text available: [pdf\(617.64 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

### 4 Robust FPGA intellectual property protection through multiple small watermarks

John Lach, William H. Mangione-Smith, Miodrag Potkonjak  
June 1999 **Proceedings of the 36th ACM/IEEE conference on Design automation DAC '99**

**Publisher:** ACM Press

Full text available: [pdf\(119.08 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

**Keywords:** field programmable gate array (FPGA), intellectual property protection, watermarking

## 5 Applications I: Estimation of recording location using audio watermarking

Yuta Nakashima, Ryuki Tachibana, Masafumi Nishimura, Noboru Babaguchi  
September 2006 **Proceeding of the 8th workshop on Multimedia and security MM&Sec '06**

**Publisher:** ACM Press

Full text available: [pdf\(209.98 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

In this paper, we propose a novel application of audio watermarking, estimation of recording location. The purpose of the paper is to determine the seat location in a theater at which a bootleg recording was made by using a digital video camera. In the proposed application, we embed different watermarks in the channels of the multi-channel sound of the movie. The multi-channel sound enters the air from multiple loudspeakers in a theater. If a monaural recording of the sound is made, the location ...

**Keywords:** bootleg, digital audio watermarking, estimation, recording location

## 6 How watermarking adds value to digital content

John M. Acken  
July 1998 **Communications of the ACM**, Volume 41 Issue 7

**Publisher:** ACM Press

Full text available: [pdf\(273.94 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#), [review](#)

## 7 Opportunities for watermarking standards

Fred Mintzer, Gordon W. Braudaway, Alan E. Bell  
July 1998 **Communications of the ACM**, Volume 41 Issue 7

**Publisher:** ACM Press

Full text available: [pdf\(672.37 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#), [review](#)

## 8 Robust mesh watermarking

Emil Praun, Hugues Hoppe, Adam Finkelstein  
July 1999 **Proceedings of the 26th annual conference on Computer graphics and interactive techniques SIGGRAPH '99**

**Publisher:** ACM Press/Addison-Wesley Publishing Co.

Full text available: [pdf\(2.08 MB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

**Keywords:** copyright protection, steganography

## 9 Demo session: XML data management: WmXML: a system for watermarking XML data

Xuan Zhou, HweeHwa Pang, Kian-Lee Tan, Dhruv Mangla  
August 2005 **Proceedings of the 31st international conference on Very large data bases VLDB '05**

**Publisher:** VLDB Endowment

Full text available: [pdf\(164.07 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

As increasing amount of data is published in the form of XML, copyright protection of XML data is becoming an important requirement for many applications. While digital

watermarking is a widely used measure to protect digital data from copyright offences, the complex and flexible construction of XML data poses a number of challenges to digital watermarking, such as re-organization and alteration attacks. To overcome these challenges, the watermarking scheme has to be based on the usability of da ...

**10 Detection of video sequences using compact signatures**

 **Justin Zobel, Timothy C. Hoad**  
**January 2006 ACM Transactions on Information Systems (TOIS)**, Volume 24 Issue 1

**Publisher:** ACM Press

Full text available:  [pdf\(725.90 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Digital representations are widely used for audiovisual content, enabling the creation of large online repositories of video, allowing access such as video on demand. However, the ease of copying and distribution of digital video makes piracy a growing concern for content owners. We investigate methods for identifying coderivative video content---that is, video clips that are derived from the same original source. By using dynamic programming to identify regions of similarity in video signatures ...

**Keywords:** Video similarity detection, dynamic programming, local alignment

**11 Security analysis II: Digital watermarking security considerations**

 **Rade Petrovic, Babak Tehranchi, Joseph M. Winograd**  
**September 2006 Proceeding of the 8th workshop on Multimedia and security MM&Sec '06**

**Publisher:** ACM Press

Full text available:  [pdf\(253.62 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

In this paper, we review our past experience with security of copy control audio watermarks, particularly related to SDMI. We also classify and analyze attacks published in literature and propose a number of security enhancement techniques for copy control and other digital watermarking applications. One type of security measure is based on uncoordinated selection of hiding places between embedders and extractors, with statistical analysis of expected matches. This approach reduces the repeatabi ...

**Keywords:** SDMI, copy control, digital rights management, digital watermarking, watermark attacks

**12 Nark: receiver-based multicast non-repudiation and key management**

 **Bob Briscoe, Ian Fairman**  
**November 1999 Proceedings of the 1st ACM conference on Electronic commerce EC '99**

**Publisher:** ACM Press

Full text available:  [pdf\(168.86 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

**Keywords:** Internet, audit trail, key management, multicast, non-repudiation, smartcard, watermark

**13 Watermarking: The effects of invisible watermarking on satellite image classification**

 **Gregory L. Heileman, Yunlong Yang**  
**October 2003 Proceedings of the 3rd ACM workshop on Digital rights management DRM '03**

**Publisher:** ACM Press

Full text available: [pdf\(1.46 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Remotely sensed satellite images are an important source of geographical data commonly used as input for various types of classification algorithms. For example, these algorithms are commonly used to classify earth land cover, analyze crop conditions, assess mineral and petroleum deposits, and quantify urban growth. Many vendors of digital images are using or are considering the use of invisible watermarking as a means of protecting their images from theft or unauthorized usage. Indeed, the use ...

**Keywords:** classification, content protection, information hiding, satellite imagery, watermarking

#### 14 Dynamic path-based software watermarking

 C. Collberg, E. Carter, S. Debray, A. Huntwork, J. Kececioglu, C. Linn, M. Stepp  
June 2004 **ACM SIGPLAN Notices , Proceedings of the ACM SIGPLAN 2004 conference on Programming language design and implementation PLDI '04**, Volume 39 Issue 6

**Publisher:** ACM Press

Full text available: [pdf\(282.11 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Software watermarking is a tool used to combat software piracy by embedding identifying information into a program. Most existing proposals for software watermarking have the shortcoming that the mark can be destroyed via fairly straightforward semantics-preserving code transformations. This paper introduces path-based watermarking, a new approach to software watermarking based on the dynamic branching behavior of programs. The advantage of this technique is that error-correcting and tamper-proo ...

**Keywords:** software piracy, software protection, watermarking

#### 15 Reconfigurable hardware solutions for the digital rights management of digital cinema

 G. Rouvroy, F.-X. Standaert, F. Lefèvre, J.-J. Quisquater, B. Macq, J.-D. Legat  
October 2004 **Proceedings of the 4th ACM workshop on Digital rights management DRM '04**

**Publisher:** ACM Press

Full text available: [pdf\(440.86 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

This paper presents a hardware implementation of a decoder for Digital Cinema images. This decoder enables us to deal with image size of 2K with 24 frames per second and 36 bits per pixels. It is the first implementation known nowadays that perfectly fits in one single Virtex-II® FPGA and includes AES decryption, JPEG 2000 decompression and fingerprinting blocks. This hardware offers therefore high-quality image processing as well as robust security.

**Keywords:** AES, DRM, FPGA, JPEG 2000, digital cinema, watermarking

#### 16 FS2: dynamic data replication in free disk space for improving disk performance and energy consumption

 Hai Huang, Wanda Hung, Kang G. Shin  
October 2005 **ACM SIGOPS Operating Systems Review , Proceedings of the twentieth ACM symposium on Operating systems principles SOSP '05**, Volume 39 Issue 5

**Publisher:** ACM Press

Full text available:  pdf(542.63 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Disk performance is increasingly limited by its head positioning latencies, i.e., seek time and rotational delay. To reduce the head positioning latencies, we propose a novel technique that *dynamically* places copies of data in file system's *free blocks* according to the disk access patterns observed at runtime. As one or more replicas can now be accessed in addition to their original data block, choosing the "nearest" replica that provides fastest access can significantly improve pe ...

**Keywords:** data replication, disk layout reorganization, dynamic file system, free disk space

**17 Enabling the 21st century health care information technology revolution** 

 Rakesh Agrawal, Tyrone Grandison, Christopher Johnson, Jerry Kiernan

February 2007 **Communications of the ACM**, Volume 50 Issue 2

**Publisher:** ACM Press

Full text available:  pdf(678.19 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)  
 html(42.75 KB)

The U.S. government's vision of the health care information infrastructure is possible using technologies that support the sharing of medical e-records while maintaining patient privacy.

**18 Watermarking: Words are not enough: sentence level natural language watermarking** 

 Mercan Topkara, Umut Topkara, Mikhail J. Atallah

October 2006 **Proceedings of the 4th ACM international workshop on Contents protection and security MCPS '06**

**Publisher:** ACM Press

Full text available:  pdf(283.99 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Compared to other media, natural language text presents unique challenges for information hiding. These challenges require the design of a robust algorithm that can work under following constraints: (i) low embedding bandwidth, i.e., number of sentences is comparable with message length, (ii) not all transformations can be applied to a given sentence (iii) the number of alternative forms for a sentence is relatively small, a limitation governed by the grammar and vocabulary of the natural language ...

**Keywords:** natural language watermarking

**19 Special issue on independent components analysis: ICA for watermarking digital images** 

Stéphane Bounkong, Borémi Toch, David Saad, David Lowe

December 2003 **The Journal of Machine Learning Research**, Volume 4

**Publisher:** MIT Press

Full text available:  pdf(554.76 KB) Additional Information: [full citation](#), [abstract](#), [citations](#), [index terms](#)

We present a domain-independent ICA-based approach to watermarking. This approach can be used on images, music or video to embed either a robust or fragile watermark. In the case of robust watermarking, the method shows high information rate and robustness against malicious and non-malicious attacks, while keeping a low induced distortion. The fragile watermarking scheme, on the other hand, shows high sensitivity to tampering attempts while keeping the requirement for high information rate and lo ...

**20 An abstract interpretation-based framework for software watermarking**

Patrick Cousot, Radhia Cousot  
January 2004

**ACM SIGPLAN Notices , Proceedings of the 31st ACM SIGPLAN-SIGACT  
symposium on Principles of programming languages POPL '04, Volume 39**

Issue 1

**Publisher:** ACM Press

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Software watermarking consists in the intentional embedding of indelible stegosignatures or watermarks into the subject software and extraction of the stegosignatures embedded in the stegoprograms for purposes such as intellectual property protection. We introduce the novel concept of *abstract software watermarking*. The basic idea is that the watermark is hidden in the program code in such a way that it can only be extracted by an abstract interpretation of the (maybe non-standard) concre ...

**Keywords:** abstract interpretation, authentication, copyrights protection, fingerprinting, identification, intellectual property protection, obfuscation, software authorship, software watermarking, static analysis, steganography, stegoanalyst, stegoattacks, stegokey, stegomark, stegosignature, tamper-proofing, trustworthiness, validation watermarking

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**1** Technical trials and legal tribulations

 Scott Craver, Boon-Lock Yeo, Minerva Yeung  
July 1998 **Communications of the ACM**, Volume 41 Issue 7

**Publisher:** ACM Press

Full text available: [pdf\(641.01 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#), [review](#)

**2** Applications I: Estimation of recording location using audio watermarking

 Yuta Nakashima, Ryuki Tachibana, Masafumi Nishimura, Noboru Babaguchi  
September 2006 **Proceeding of the 8th workshop on Multimedia and security MM&Sec '06**
**Publisher:** ACM Press

Full text available: [pdf\(209.98 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)


In this paper, we propose a novel application of audio watermarking, estimation of recording location. The purpose of the paper is to determine the seat location in a theater at which a bootleg recording was made by using a digital video camera. In the proposed application, we embed different watermarks in the channels of the multi-channel sound of the movie. The multi-channel sound enters the air from multiple loudspeakers in a theater. If a monaural recording of the sound is made, the location ...

**Keywords:** bootleg, digital audio watermarking, estimation, recording location

**3** Robust FPGA intellectual property protection through multiple small watermarks

 John Lach, William H. Mangione-Smith, Miodrag Potkonjak  
June 1999 **Proceedings of the 36th ACM/IEEE conference on Design automation DAC '99**
**Publisher:** ACM Press

Full text available: [pdf\(119.08 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

**Keywords:** field programmable gate array (FPGA), intellectual property protection, watermarking

#### 4 Robust mesh watermarking

Emil Praun, Hugues Hoppe, Adam Finkelstein

July 1999 **Proceedings of the 26th annual conference on Computer graphics and interactive techniques SIGGRAPH '99**

Publisher: ACM Press/Addison-Wesley Publishing Co.

Full text available: [pdf\(2.08 MB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

**Keywords:** copyright protection, steganography

#### 5 Demo session: XML data management: WmXML: a system for watermarking XML data

Xuan Zhou, HweeHwa Pang, Kian-Lee Tan, Dhruv Mangla

August 2005 **Proceedings of the 31st international conference on Very large data bases VLDB '05**

Publisher: VLDB Endowment

Full text available: [pdf\(164.07 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

As increasing amount of data is published in the form of XML, copyright protection of XML data is becoming an important requirement for many applications. While digital watermarking is a widely used measure to protect digital data from copyright offences, the complex and flexible construction of XML data poses a number of challenges to digital watermarking, such as re-organization and alteration attacks. To overcome these challenges, the watermarking scheme has to be based on the usability of da ...

#### 6 Opportunities for watermarking standards

Fred Mintzer, Gordon W. Braudaway, Alan E. Bell

July 1998 **Communications of the ACM**, Volume 41 Issue 7

Publisher: ACM Press

Full text available: [pdf\(672.37 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#), [review](#)

#### 7 Special issue on independent components analysis: ICA for watermarking digital images

Stéphane Bounkong, Borémi Toch, David Saad, David Lowe

December 2003 **The Journal of Machine Learning Research**, Volume 4

Publisher: MIT Press

Full text available: [pdf\(554.76 KB\)](#) Additional Information: [full citation](#), [abstract](#), [citations](#), [index terms](#)

We present a domain-independent ICA-based approach to watermarking. This approach can be used on images, music or video to embed either a robust or fragile watermark. In the case of robust watermarking, the method shows high information rate and robustness against malicious and non-malicious attacks, while keeping a low induced distortion. The fragile watermarking scheme, on the other hand, shows high sensitivity to tampering attempts while keeping the requirement for high information rate and lo ...

#### 8 Watermarking: The effects of invisible watermarking on satellite image classification

Gregory L. Heileman, Yunlong Yang

October 2003 **Proceedings of the 3rd ACM workshop on Digital rights management DRM '03**

Publisher: ACM Press

Full text available: [pdf\(1.46 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index](#)

terms

Remotely sensed satellite images are an important source of geographical data commonly used as input for various types of classification algorithms. For example, these algorithms are commonly used to classify earth land cover, analyze crop conditions, assess mineral and petroleum deposits, and quantify urban growth. Many vendors of digital images are using or are considering the use of invisible watermarking as a means of protecting their images from theft or unauthorized usage. Indeed, the use ...

**Keywords:** classification, content protection, information hiding, satellite imagery, watermarking

**9 Robust digital watermarking: The digital watermarking container: secure and efficient embedding** 

 Martin Steinebach, Sascha Zmudzinski, Fan Chen  
September 2004 **Proceedings of the 2004 workshop on Multimedia and security MM&Sec '04**

**Publisher:** ACM Press

Full text available:  pdf(357.96 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

While acceptance of digital watermarking as a technology to protect digital media is constantly increasing, integrated applications are still comparatively rare. Two reasons are the challenge of secure key handling due to the symmetric nature of digital watermarking and the often high demand regarding computational power to embed a watermarking into a media file. We introduce a possible solution to this problem, the digital watermarking container. It splits the watermarking process in a preproce ...

**Keywords:** complexity, container, optimization, security, watermarking

**10 Watermarking: Words are not enough: sentence level natural language watermarking** 

 Mercan Topkara, Umut Topkara, Mikhail J. Atallah  
October 2006 **Proceedings of the 4th ACM international workshop on Contents protection and security MCPS '06**

**Publisher:** ACM Press

Full text available:  pdf(283.99 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Compared to other media, natural language text presents unique challenges for information hiding. These challenges require the design of a robust algorithm that can work under following constraints: (i) low embedding bandwidth, i.e., number of sentences is comparable with message length, (ii) not all transformations can be applied to a given sentence (iii) the number of alternative forms for a sentence is relatively small, a limitation governed by the grammar and vocabulary of the natural langua ...

**Keywords:** natural language watermarking

**11 Watermarking: Watermarking of MPEG-2 video in compressed domain using VLC** 

 Bijan G. Mobasseri, Michael P. Marcinak  
August 2005 **Proceedings of the 7th workshop on Multimedia and security MM&Sec '05**

**Publisher:** ACM Press

Full text available:  pdf(258.86 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

In this work we propose a new algorithm for fragile, high capacity yet file-size preserving

watermarking of MPEG-2 streams. Watermarking is done entirely in the compressed domain, with no need for full or even partial decompression. The algorithm is based on a previously developed concept of VLC mapping for compressed domain watermarking. The entropy-coded segment of the video is first parsed out and then analyzed in pairs. It is recognized that there are VLC pairs that never appear together in ...

**Keywords:** MPEG-2, compressed domain, variable length code

**12 An abstract interpretation-based framework for software watermarking**

 Patrick Cousot, Radhia Cousot

January 2004 **ACM SIGPLAN Notices , Proceedings of the 31st ACM SIGPLAN-SIGACT symposium on Principles of programming languages POPL '04**, Volume 39

Issue 1

**Publisher:** ACM Press

Full text available: .pdf(171.12 KB)

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Software watermarking consists in the intentional embedding of indelible stegosignatures or watermarks into the subject software and extraction of the stegosignatures embedded in the stegoprograms for purposes such as intellectual property protection. We introduce the novel concept of *abstract software watermarking*. The basic idea is that the watermark is hidden in the program code in such a way that it can only be extracted by an abstract interpretation of the (maybe non-standard) concrete ...

**Keywords:** abstract interpretation, authentication, copyrights protection, fingerprinting, identification, intellectual property protection, obfuscation, software authorship, software watermarking, static analysis, steganography, stegoanalyst, stegoattacks, stegokey, stegomark, stegosignature, tamper-proofing, trustworthiness, validation watermarking

**13 Watermarking cyberspace**

 Hal Berghel

November 1997 **Communications of the ACM**, Volume 40 Issue 11

**Publisher:** ACM Press

Full text available: .pdf(1.70 MB)

Additional Information: [full citation](#), [citations](#), [index terms](#)

**14 Digital watermarking makes its mark**

 Hal Berghel

September 1998 **netWorker**, Volume 2 Issue 4

**Publisher:** ACM Press

Full text available: .pdf(617.64 KB)

Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

**15 Nark: receiver-based multicast non-repudiation and key management**

 Bob Briscoe, Ian Fairman

November 1999 **Proceedings of the 1st ACM conference on Electronic commerce EC '99**

**Publisher:** ACM Press

Full text available: .pdf(168.86 KB)

Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

**Keywords:** Internet, audit trail, key management, multicast, non-repudiation, smartcard,

watermark

**16 Fingerprinting intellectual property using constraint-addition** Gang Qu, Miodrag Potkonjak  
June 2000 **Proceedings of the 37th conference on Design automation DAC '00****Publisher:** ACM PressFull text available:  pdf(123.86 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Recently, intellectual property protection (IPP) techniques attracted a great deal of attention from semiconductor, system integration and software companies. A number of watermarking-based techniques have been proposed for IPP. One of the key limitations of watermarking is that it does not facilitate tracing of illegally resold intellectual property (IP). Fingerprinting resolves this problem by providing each customer with a unique instance of functionally identical IP. We propose ...

**17 Poster session 2: VLSI CAD tool protection by birthmarking design solutions** Lin Yuan, Gang Qu, Ankur Srivastava  
April 2005 **Proceedings of the 15th ACM Great Lakes symposium on VLSI GLSVSLI '05****Publisher:** ACM PressFull text available:  pdf(53.38 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Many techniques have been proposed in the past for the protection of VLSI design IPs (intellectual property). CAD tools and algorithms are intensively used in all phases of modern VLSI designs; however, little has been done to protect them. Basically, given a problem  $P$  and a solution  $\Sigma$ , we want to be able to determine whether  $\Sigma$  is obtained by a particular tool or algorithm. We propose two techniques that intentionally leave some *trace* or *birthmark*, which refers to cer ...

**Keywords:** CAD, birthmarking, intellectual property, protection**18 Data security and protection: Rights protection for relational data** Radu Sion, Mikhail Atallah, Sunil Prabhakar  
June 2003 **Proceedings of the 2003 ACM SIGMOD international conference on Management of data SIGMOD '03****Publisher:** ACM PressFull text available:  pdf(229.76 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Protecting rights over relational data is of ever increasing interest, especially considering areas where sensitive, valuable content is to be outsourced. A good example is a data mining application, where data is sold in pieces to parties specialized in mining it. Different avenues for rights protection are available, each with its own advantages and drawbacks. Enforcement by legal means is usually ineffective in preventing theft of copyrighted works, unless augmented by a digital counter ...

**19 Video services: NTT's technologies for next-generation video services** Yutaka Tashiro, Yoshiyuki Yashima, Hiroshi Fuji  
January 2006 **Computers in Entertainment (CIE)**, Volume 4 Issue 1**Publisher:** ACM PressFull text available:  pdf(1.04 MB) Additional Information: [full citation](#), [abstract](#), [index terms](#)

This article presents some examples of video content delivery and two-way video communication services and describes current trends in the digital media technology supporting these services. It also describes NTT's research efforts in subjects such as

video coding and introduces our vision of business services that combine high-quality secure video delivery with high added-value processing.

**Keywords:** H.264, IP network, MPEG-2, MPEG-4/AVC, business application, image compression, network, secure video, video CODEC, video decoder, video distribution, video encoder, video service, watermark

**20** Reconfigurable hardware solutions for the digital rights management of digital cinema 

 G. Rouvroy, F.-X. Standaert, F. Lefèvre, J.-J. Quisquater, B. Macq, J.-D. Legat

October 2004 **Proceedings of the 4th ACM workshop on Digital rights management**  
**DRM '04**

**Publisher:** ACM Press

Full text available:  [pdf\(440.86 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

This paper presents a hardware implementation of a decoder for Digital Cinema images. This decoder enables us to deal with image size of 2K with 24 frames per second and 36 bits per pixels. It is the first implementation known nowadays that perfectly fits in one single Virtex-II® FPGA and includes AES decryption, JPEG 2000 decompression and fingerprinting blocks. This hardware offers therefore high-quality image processing as well as robust security.

**Keywords:** AES, DRM, FPGA, JPEG 2000, digital cinema, watermarking

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**IEEE CNF** IEEE Conference Proceeding

**IET CNF** IET Conference Proceeding

**IEEE STD** IEEE Standard

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24. **Efficient spatial image watermarking via new perceptual masking and blind schemes**  
Karybali, I.G.; Berberidis, K.;  
[Information Forensics and Security, IEEE Transactions on](#)  
Volume 1, Issue 2, June 2006 Page(s):256 - 274  
Digital Object Identifier 10.1109/TIFS.2006.873652  
[AbstractPlus](#) | [Full Text: PDF\(3512 KB\)](#) IEEE JNL  
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25. **Watermarking relying on cover signal content to hide synchronization marks**  
Delannay, D.; Macq, B.;  
[Information Forensics and Security, IEEE Transactions on](#)  
Volume 1, Issue 1, March 2006 Page(s):87 - 101  
Digital Object Identifier 10.1109/TIFS.2005.863499  
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The detector may also quantify the extent of **watermark degradation**. ... enable/prevent its transmission, **playback, recording** or copying). ...

[www.freepatentsonline.com/6516079.html](http://www.freepatentsonline.com/6516079.html) - 56k - [Cached](#) - [Similar pages](#)

**TG Daily - Philips watermark tech traces pirated TV content**

It HAS to be to survive "severe quality **degradation** of the video such as ... HD video **playback and recording** added to Nero · Adobe rolls out betas of pro ...

[www.tgdaily.com/content/view/31575/97/](http://www.tgdaily.com/content/view/31575/97/) - 53k - [Cached](#) - [Similar pages](#)

**» Watermarks: A better DRM than DRM itself? | Between the Lines ...**

If TiVo's "watermark" approach to the same problem that DRM was meant to solve takes any ... We were more angry about the quality **degradation** before any ...

[blogs.zdnet.com/BTL/?p=2210](http://blogs.zdnet.com/BTL/?p=2210) - 71k - Apr 22, 2007 - [Cached](#) - [Similar pages](#)

**Method and system for preventing unauthorized **playback** of ...**

The idea behind a **watermark** is that it should not be able to be removed ... the **recording** can be transmitted to a network of non-compliant **playback** devices. ...

[www.patentstorm.us/patents/6530021-description.html](http://www.patentstorm.us/patents/6530021-description.html) - 38k - [Cached](#) - [Similar pages](#)

**[PDF] An overview of multimedia content protection in consumer ...**

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In multimedia applications, the **watermark** should be invisible or ... **playback or recording**.

The DVD Audio copy protection framework, which allows personal ...

[ftp://skynet.ecn.purdue.edu/pub/dist/delp/ei00-consumer/paper.pdf](http://skynet.ecn.purdue.edu/pub/dist/delp/ei00-consumer/paper.pdf) - [Similar pages](#)

**[PDF] Introduction**

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**record, playback** and generation control has been presented here. ... Terms: random seed

U, Physical mark P, **watermark** W and F - a cryptographic one-way ...

[islab.oregonstate.edu/koc/ece478/02Report/P.pdf](http://islab.oregonstate.edu/koc/ece478/02Report/P.pdf) - [Similar pages](#)

**[PDF] Slide 1**

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**Degradation** of performance due to lock waits. - Deadlocking. - SQLCODE -912 ...

**Record/Playback.** Record feature allows. the capture of all activity ...

[www.quest.com/spotlight\\_on\\_db2/pdfs/Discover\\_Diagnose\\_Resolve\\_Pt1.pdf](http://www.quest.com/spotlight_on_db2/pdfs/Discover_Diagnose_Resolve_Pt1.pdf) - [Similar pages](#)

**[PDF] Copy Protection for DVD Video**

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The two functions of the **watermark** mentioned. above are referred to as "record control" and "playback control", respectively. Record control takes over the ...

[www.adastral.ucl.ac.uk/~icox/papers/1999/ProcIEEE1999b.pdf](http://www.adastral.ucl.ac.uk/~icox/papers/1999/ProcIEEE1999b.pdf) - [Similar pages](#)

**[PDF] Copy protection for DVD video - Proceedings of the IEEE**

File Format: PDF/Adobe Acrobat

**watermark** in a frame by a systematic **degradation** of. the image. ... resents the number of **playback and recording** generations. allowed. ...

[ieeexplore.ieee.org/iel5/5/16709/00771077.pdf?arnumber=771077](http://ieeexplore.ieee.org/iel5/5/16709/00771077.pdf?arnumber=771077) - [Similar pages](#)

**Record SACD full 24bit - Hydrogenaudio Forums**

This PCM DA converter is fed with 24bit data during playback of SACD. ... a player-unique watermark is inserted in the PCM stream and if a record company is ...  
[www.hydrogenaudio.org/forums/index.php?showtopic=40627](http://www.hydrogenaudio.org/forums/index.php?showtopic=40627) - 137k -  
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